

ABSTRACT

Fiber laser unit 1 comprises a plurality of fiber lasers 2 and 3 that generate laser beams by exciting a laser active substance inside cores 2a and 3a by exciting light, propagate the laser beams inside the cores 2a and 3a, and output the laser beams from the end portions 2c and 3c, wherein the respective fiber lasers 2 and 3 have resonators 4 and 5 that reflect the laser beams on both ends 2b, 2c, 3b, and 3c thereof and have a structure in which a part of the cores 2a and 3a is reduced in diameter, the diameter reduced portions of the cores 2a and 3a are made proximal to each other, injection synchronization is carried out inside the resonators 4 and 5 by laser beams leaked from the cores 2a and 3a, and a loss is applied to the port of either one of the fiber lasers 2 and 3. According to this fiber laser unit 1, by a simple structure in which the cores 2a and 3a are made proximal to each other and injection synchronization is carried out by using laser beams leaked from the cores 2a and 3a, coherent addition of lasers with extremely high addition efficiency is realized.